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ABSTRACT

The conceptualization of the term "psycholinguistic ability" led to the definition of an area of language behavior that is not well represented in achievement tests in English nor in existing tests of verbal intelligence. Thus, the Linguistic Ability Test (LAT) was designed, pilot-tested, revised, and field-tested in an attempt to measure the skills implied by psycholinguistic ability. The field testing involved 106 fourth- and 105 sixth-grade students whose mean IQ score was 104.6 points. The LAT showed very high reliability (Hoyt internal consistency) at both grade levels. The item analysis data are presented for the entire test (148 items) as well as for the 15 subsections of the test. Mean scores at each grade level and for male and female subjects are given as well as the intercorrelations of the 15 subsections, the total test, and Otis IQ score. The future importance of the LAT is projected. The test, along with its planned revisions, is included in the report. (Author/JD)

ANALYSIS OF THE LINGUISTIC ABILITY TEST

GRADES 4 & 6.

WISCONSIN RESEARCH AND DEVELOPMENT

CENTER FOR
COGNITIVE LEARNING

Technical Report No. 121

ANALYSIS OF THE LINGUISTIC ABILITY TEST, GRADES 4 & 6

Wayne C. Fredrick, Lester S. Golub, and Shelby L. Johnson

Report from the Language Arts Project in Writing, 204
Dr. Lester S. Golub, Principal Investigator

Wisconsin Research & Development
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This Technical Report is from Project 204 in Program 2. General objectives of the Program are to establish rationale and strategy for developing instructional systems, to identify sequences of concepts and cognitive skills, to identify or develop instructional materials associated with the concepts and cognitive skills, and to generate new knowledge about instructional procedures. Contributing to these Program objectives, the Project staff, in cooperation with area teachers, prepared a scope-and-sequence statement of reading skills for the elementary school as a first step in the development of an instructional program. From this outline, assessment procedures and group placement tests have been developed and existing instructional materials have been keyed to the outline. Additional components are being developed and research is being conducted to refine the program and to generate new knowledge which will be incorporated into the system.

CONTENTS

LIST OF TABLES

ABSTRACT

The conceptualization of the term "psycholinguistic ability" led to the definition of an area of language behavior that is not well represented in achievement tests in English nor in existing tests of verbal intelligence. Thus, the Linguistic Ability Test was designed, pilot-tested, revised, and field-tested in an attempt to measure the skills implied by psycholinguistic ability. The field testing involved 106 Fourth- and 105 Sixth-Grade Ss, whose mean IQ score was 104.6 points. The LAT showed very high reliability (Hoyt internal consistency) at both grade levels. The item analysis data are presented for the entire test (148 items) as well as for the 15 subsections of the test. Mean scores at each grade level and for male and female Ss are given and also the intercorrelations of the 15 subsections, the total test, and Otis IQ score. The future importance of the LAT is projected, and the test, along with its planned revisions, is included in the report.

I
INTRODUCTION

This is a report of the field testing of the LAT (Linguistic Ability Test), which was developed to measure a child's psycholinguistic ability. While tests of achievement in language measure such skills as error recognition, punctuation, capitalization, spelling, handwriting, transcription accuracy, alphabetization, and use of reference materials and such points of knowledge as vocabulary, rules of grammar, word usage, and grammatical terminology, these are not the abilities that seem to be the result of an intuitive aspect of language development. Psycholinguistic ability is meant to include this intuitive aspect and is the kind of skill involved in dealing with language as a system, a discovery of the rules that guide the construction and analysis of words and sentences. In achievement tests, sentence recognition and reading comprehension approach this kind of skill. But more exactly, psycholinguistic ability is specifically concerned with the recognition and manipulation of phonemes, morphemes, words, form-classes, word function, sentence constituents, and sentences.

The discovery and manipulation of the system behind language seemed a necessary and fruitful area for testing. Obviously, the extent of one's understanding of the way one's language works will be critical in any area requiring verbal growth, such as is necessary in education and desirable in many other human pursuits as well. The prospect of meaningfully intervening to alter and extend a child's conception of the language as a system reinforced the need for teachers to know a student's level of psycholinguistic ability.

The development of the LAT to the point of field testing has already been reported (Golub, Fredrick, & Johnson, 1969). In brief, 148 objective test items comprising 15 specifiable behaviors were prepared. These items are shown in Appendix A. The behaviors are included in the present report as Appendix C. Each behavior was conceived as a facet of one's capability in dealing with the language. There are many other behaviors that could have been specified and included in the test and some that were included now seem of doubtful value. But as an initial operational measure of psycholinguistic ability, the behaviors seemed to have a face validity and appeared to be present in varying degrees in elementary school children.

The present study was designed to provide data on the usefulness and adequacy of the LAT. Heterogeneous groups of Fourth and Sixth Graders were selected and given the test. Their responses were subjected to item analysis to obtain estimates of the internal consistency, difficulty, and power of discrimination. The scores of the students were tested by analysis of variance F ratios to determine whether differences between grade levels and between sexes would be detected. The correlation of the LAT score with IQ score and the intercorrelations of the subsections of the LAT were obtained.

II
METHOD

SUBJECTS

Through the efforts of the R & D Technical Section, George Glasrud of the State Department of Public Instruction, and Lyman B. Olsen, Assistant Superintendent in Beloit, Wisconsin, two elementary schools in Beloit agreed to participate in the field testing of the LAT and the collection of written discourse samples under controlled experimental conditions. The two schools were Waterman Elementary, Mr. Ralph Crow, Principal, and Cunningham Elementary, Mr. C. C. Uber, Principal. Two Fourth-Grade and two Sixth-Grade classes in each school participated. The teachers and numbers of students in each classroom were as follows:

Grade 4

Cunningham:	Mrs. Ione Clark	
	6 boys	19 girls
Cunningham:	Mrs. Judy Karstaedt	
	15 boys	10 girls
Waterman:	Miss Sallie Adams	
	17 boys	12 girls
Waterman:	Mrs. Lois Keen	
	17 boys	10 girls

Grade 6

Cunningham:	Mrs. Margaret Fouse	
	11 boys	15 girls
Cunningham:	Mr. Edward Fujikawa	
	14 boys	10 girls
Waterman:	Mr. Booker Street	
	11 boys	14 girls
Waterman:	Mr. Jan Hoffman	
	16 boys	14 girls

Thus a total of 211 Ss, 107 boys and 104 girls, were involved. One hundred were from Cunningham School and 111 were from Waterman. There were 106 Fourth Graders and 105 Sixth Graders. One student was Mexican, 1 was Japanese, 16 were Negro, and 193 were Caucasian. At the time of testing, the Fourth Graders ranged in age from 9 years, 4 months to 11 years, 2 months. The median age was 10 years, 0 months; the mode was 10 years, 3 months; and 86% of the Ss were within 6 months of the median age of 10. The Sixth Graders ranged from 11 years, 3 months, to 13 years, 2 months. The median age was 12 years, 0 months; the mode was 11 years, 7 months; and 84% of the Ss were within 6 months of the median age of 12.

The Fourth and Sixth Graders at both Cunningham and Waterman Schools had been given the Otis Beta E Intelligence Test in October 1968, 6 months prior to the gathering of the present data. Three students had moved into the school system after October and only a WISC IQ score was available. These three scores were treated as Otis scores. IQ data were not available for three Fourth Graders and three Sixth Graders. The mean IQ of the Fourth Graders was 104.81 with a standard deviation of 10.1. The Sixth-Grade mean was 104.47 with a standard deviation of 13.9. The Fourth- and Sixth-Grade median IQ scores were 105 and 102, respectively. The mean IQ's of the males and females were 103.42 and 105.89, respectively (standard deviations 12.4 and 11.5). The Fourth- and Sixth-Grade means were not significantly different, although the variances approached a significant F ratio ($F_{101,102} = 1.38$; F required at .05 level is 1.39). The difference between the IQ means for males and females was significant ($t_{203} = 2.45$; t required at .05 and .01 levels are 1.97 and 2.59, respectively), but the variance ratio of males and females was not significant.

LINGUISTIC ABILITY TEST (LAT)

The LAT had 15 sections containing a total of 148 items. Each section was designed to test a specific psycholinguistic ability (Appendix C). The test required approximately 1 1/2

hours for completion. All directions and some questions were tape-recorded to avoid possible reading problems and to provide uniform pacing for all respondents. Types of questions included two-choice, multiple-choice, matching, and rating. A complete report of the rationale, construction, and history of LAT appears in Working Paper No. 33.

PROCEDURES

Four investigators worked with the children in Waterman School on May 22 and with those in Cunningham School on May 23. On both days the two Fourth-Grade classrooms worked simultaneously in the morning; the Sixth-Grade classrooms, in the afternoon. Two investigators in each classroom conducted the testing sessions, although at all times the class teacher was present. The children remained in their regular classroom and took their scheduled recess as usual. Additional rest breaks were provided to prevent fatigue and restlessness. During the brief 3- or 4-minute breaks, students had some sort of physical activity, usually in walking to the drinking fountain or moving around the room. Breaks were generally taken after Pages 5 and 9 of the test.

Whenever several students did not understand the task required of them, during the testing, the tape was stopped and one investigator explained again the procedure for that particular section of items. Of the 15 sections in LAT the directions for five needed clarification in some or all classes. Before beginning the test itself, students provided the biographical information requested on the cover page of the test booklet.

III
RESULTS

ITEM ANALYSIS OF THE LINGUISTIC ABILITY TEST

The 148 items in the LAT were analyzed using the FORTAP (Baker & Martin, 1968), a computer program which provides the score of each individual S, the Hoyt internal consistency reliability and the standard error of measurement of the test instrument, and item statistics such as the number of responses, the option-test biserial correlation, and the parameters for each correct and incorrect option in the test. All these data are computed on the basis of a weighted set of scoring keys supplied by the user.

With an a priori scoring key (Key #1), in which all the options that were constructed to be the correct choice were weighted two points and other options that seemed to be reasonable but not completely correct were given one point, the Hoyt internal consistency reliability coefficients (Hoyt R) for Fourth and Sixth Grades were .932 and .948, respectively. The standard errors of measurement (SE) at Fourth and Sixth Grades were 10.2 and 9.7 points, respectively.

Detailed item statistics are provided in Table 1. The 148 items of LAT corresponding to the item numbers are shown in Appendix A. Of the 179 weighted options in Key #1, 95 showed a significant biserial R at Fourth Grade and 114 were significant at Sixth Grade. None of the 31 options that were weighted one point showed a significant biserial R. In addition, items Nos. 2, 15, 17, 23, 115, 117, 118, 129, 144, 146, and 148 were unsatisfactory. These results were used to construct a second scoring key. In the second scoring key the options were weighted as shown in Table 1. In general the one point options and the unsatisfactory items were given zero weights. The Hoyt R using Key #2 for the combined grades was .949 and the SE was 9.9 points. Key #2 was used to obtain the Hoyt R and SE of each of the 15 subsections when treated as a subtest. These statistics are given in Table 2. The biserial R's for each item in both the total test analysis and the subscale analysis are presented in Table 1.

Table 1 also presents the difficulty of each item, i.e., the percent choosing the correct option. A comparison of these percents between Fourth and Sixth Grades reveals which items showed a change in difficulty level, which were easy, and which were hard. Table 3 lists the items that were answered at or below a chance level at each grade, the items that were answered correctly by 80% or more students at each grade, the items showing little or no growth from Fourth to Sixth Grade, and finally those items showing a marked increase from Fourth to Sixth Grade.

Using Key #1, the Fourth Grade mean total score was 153.68 points with a standard deviation of 39.34 points. Sixth Graders showed a mean score of 184.91 points with a standard deviation of 42.50 points. The Fourth and Sixth Grade means were significantly different ($t_{209} = 4.01$; t required at .01 is 2.58), but the variance ratio of the two grades did not produce a significant F ratio ($F_{104,105} = 1.08$; F required at .05 is 1.39).

The observed means from Key #2 are shown in Table 4 for the total LAT. The differences between means were subjected to a 2-way fixed-effects model analysis of variance. The resulting F ratios and significance levels for the factors of grade and sex and the interaction are shown in Table 5. Since intelligence seemed to account for some of the variance of the scores, the same analysis was performed using the Otis IQ score as a covariate. The results of this covariance analysis appear in Table 5.

The interaction of grade and sex was not a very pronounced effect. In the three subsections of LAT in which such an interaction did

Table I

Item Analysis Data for the Weighted Options in the Linguistic Ability Test

Section & Item Number		Key #1 Correct Option	Key #1 Biserial R Gr. 4	Key #1 Biserial R Gr. 6	% Choosing The Option Gr. 4	% Choosing The Option Gr. 6	Key #2 Correct Option	Key #2 Biserial R Gr. 4 & 6	Key #2 Biserial R Subscale
I	1	2nd	74	55	97	97	2nd	58	60
	2	1st	27	x	81	86			
	3	2nd	x	39	61	64	2nd	x	49
	4	2nd	37	69	89	98	2nd	49	65
	5	2nd	43	x	71	76	2nd	34	70
	6	1st	38	x	80	86	1st	34	64
	7	2nd	x	x	83	85	2nd	x	47
	8	1st	x	31	34	58	1st	41	53
	9	2nd	51	41	68	76	2nd	48	76
II	10	1	48	45	65	72	1	46	56
	10	2*	x	x	11	17			
	11	4	x	x	57	58	4	x	29
	12	1	x	56	26	50	1	52	60
	12	2*	x	x	43	26			
	13	2	x	30	38	41	2	x	45
	13	1*	x	x	28	26			
	14	1	x	x	39	46	1	x	41
	14	2*	x	x	32	30			
	15	3	x	x	22	29			
	15	4*	x	x	60	62			
	16	4	36	38	55	64	4	39	46
	17	2	x	x	33	38			
	17	1*	x	x	18	18			
	18	2	x	x	30	30	2	x	43
	18	1*	x	x	24	24			
	18	3*	x	x	28	31			
	19	1	x	x	35	33	1	x	x
	19	2*	53	x	34	35			
	20	1	47	36	42	57	1	47	61
	20	2*	x	x	31	21			
	21	3	x	x	24	24	4	x	46
	21	4*	x	x	54	57			
	22	4	48	37	53	60	4	43	58
	23	3	x	x	26	35			
	23	2*	x	x	21	08			
	23	4*	x	x	41	50			
	24	1	50	76	58	69	1	64	82
	25	3	35	42	42	46	3	40	51
	25	2*	x	x	31	30			
	25	4*	x	x	13	07			
	26	3	x	x	25	36	3	29	35
	26	4*	x	x	13	10	2	33	38
	27	1	x	x	42	54	1	25	45
	27	2*	x	x	28	20	2	x	x

* Denotes options that were weighted only one point rather than two points; all correct options in Key #2 were weighted equally.

x Denotes biserial R that was not significantly different from zero.

(Table I Continued)

Section & Item Number		Key #1 Correct Option	Key #1 Biserial R Gr. 4	Key #1 Biserial R Gr. 6	% Choosing The Option Gr. 4	% Choosing The Option Gr. 6	Key #2 Correct Option	Key #2 Biserial R Gr. 4 & 6	Key #2 Biserial R Subscale
III	28	b	62	81	46	74	b	75	93
	29	c	34	50	47	70	c	48	76
	30	d	x	41	29	33	d	34	64
	31	d	46	63	23	48	d	59	80
	32	a	56	62	50	71	a	64	82
	32	b*	x	x	16	03			
	32	d*	x	x	09	10			
IV	33	6	52	60	28	34	6	55	68
	34	5	48	48	25	44	5	53	80
	35	7	54	41	19	28	7	48	81
	36	1	36	51	18	17	1	39	78
	37	4	51	58	58	69	4	55	64
	38	4	x	40	28	41	4	40	70
	39	3	60	x	17	25	3	45	73
	40	2	62	36	32	39	2	49	81
	41	7	x	60	20	30	7	40	55
	42	6	x	39	23	39	6	46	66
V	43	3	x	46	36	48	3	36	70
	44	1	x	x	13	19	1	x	35
	44	2*	x	x	53	66	2	28	41
	45	3	x	61	22	41	3	53	70
	45	4*	x	x	13	10			
	46	1	x	35	34	59	1	40	64
	47	2	x	x	08	24	2	x	39
	47	5*	x	44	22	25	5	36	59
	48	4	x	55	32	43	4	47	63
	49	2	49	70	40	70	2	64	79
	50	1	x	x	16	33	1	x	33
							3	29	50
VI	51	P	57	42	96	96	P	49	66
	52	S	47	82	82	90	S	64	97
	53	S	43	68	79	90	S	58	93
	54	RW	65	81	76	94	RW	74	93
	55	S	50	57	43	67	S	59	71
	55	RW*	x	x	43	23			
	56	P	41	76	34	53	P	62	51
	57	RW	51	74	71	83	RW	61	79
	58	RW	61	87	64	90	RW	73	91
	59	S	71	69	62	80	S	73	92
	60	P	65	66	75	87	P	68	95
	61	S	42	75	54	69	S	59	80
	62	S	67	79	73	83	S	74	91
	63	P	63	79	71	80	P	70	87
	64	S	51	69	67	86	S	63	87
	65	S	42	80	57	73	S	62	77
	66	P	x	40	41	41	P	26	x

(Table I Continued)

Section & Item Number		Key #1 Correct Option	Key #1 Biserial R Gr. 4	Key #1 Biserial R Gr. 6	% Choosing The Option Gr. 4	% Choosing The Option Gr. 6	Key #2 Correct Option	Key #2 Biserial R Gr. 4 & 6	Key #2 Biserial R Subscale
VII	67	c	x	74	33	62	c	62	76
	68	a	x	57	28	54	a	55	79
	68	d*	x	x	31	24			
	69	d	x	45	30	50	d	41	56
	69	a*	x	x	44	36			
	70	c	41	59	50	54	c	48	64
	71	b	73	58	41	63	b	68	75
	72	c	x	64	26	47	c	45	60
	73	a	45	74	55	67	a	59	66
	74	b	58	73	40	72	b	71	79
	75	d	38	43	34	57	d	47	68
	76	a	x	42	30	54	a	44	69
VIII	77	b	57	49	69	90	b	60	86
	78	c	x	29	52	59	c	30	55
	79	a	x	31	58	56	a	26	57
	80	b	67	68	67	83	b	70	92
	81	a	x	x	37	51	a	25	55
	81	b*	x	x	20	22			
	81	c*	x	x	14	15			
	82	b	42	55	64	80	b	52	82
	82	d*	x	x	14	06			
	83	d	74	73	71	85	d	74	90
	84	b	72	58	61	77	b	67	97
IX	85	b	39	58	50	50	b	45	73
	86	b	49	57	33	34	b	52	71
	87	a	56	88	67	82	a	71	71
	88	a	x	x	45	42	a	x	48
	89	c	39	54	58	67	c	47	72
	90	d	x	48	28	30	d	39	65
	91	d	x	42	24	32	d	32	62
	92	a	61	40	59	62	a	46	71
	93	c	x	x	20	24	c	x	34
X	94	B	51	60	57	85	B	60	80
	95	A	49	45	40	70	A	53	80
	96	D	55	63	58	80	D	61	84
	97	C	72	57	29	65	C	70	87
	98	H	67	65	30	55	H	69	83
	99	J	x	57	22	41	J	44	76
	100	G	55	71	43	51	G	63	81
	101	I	53	73	44	50	I	61	79
XI	102	B	38	61	78	91	B	50	94
	103	C	x	33	57	56	C	25	81
	104	A	49	53	42	63	A	56	88
	104	B*	x	x	50	25			

(Table I Continued)

Section & Item Number		Key #1 Correct Option	Key #1 Biserial R Gr. 4	Key #1 Biserial R Gr. 6	% Choosing the Option Gr. 4	% Choosing the Option Gr. 6	Key #2 Correct Option	Key #2 Biserial R Gr. 4 & 6	Key #2 Biserial R Subscale
XII	105	d	42	x	30	42	d	36	50
	106	b	71	32	75	83	b	54	66
	107	c	59	86	48	71	c	74	74
	108	b	49	88	58	71	b	68	80
	109	c	40	48	67	71	c	42	62
	109	a*	x	x	04	09			
	110	a	x	38	28	42	a	40	52
	111	d	x	43	17	26	d	x	43
	111	c*	x	x	36	35			
	112	c	57	38	42	41	c	44	65
	113	b	59	50	42	59	b	56	64
	114	d	54	36	24	45	d	49	63
	115	d	x	x	26	34			
	116	a	34	49	75	86	a	44	59
XIII	117	Y	64	x	95	100			
	118	Y	x	x	42	40			
	119	N	72	34	92	96	N	59	57
	120	Y	35	46	75	87	Y	43	71
	121	N	33	43	68	68	N	34	53
	122	N	37	60	88	97	N	49	76
	123	N	47	53	55	69	N	54	61
	124	N	40	75	77	85	N	56	62
	125	N	55	43	87	95	N	54	87
	126	Y	78	58	92	89	Y	56	85
	127	Y	55	x	49	69	Y	45	70
	128	Y	37	29	62	74	Y	36	59
	129	N	49	x	76	81			
	130	N	x	x	23	24	N	x	x
	131	N	41	53	76	88	N	48	62
	132	Y	29	x	74	67	Y	x	53
	133	Y	57	66	89	95	Y	63	68
	134	Y	x	44	48	51	Y	27	41
	135	Y	28	34	62	69	Y	31	62
	136	N	67	80	84	95	N	73	85
XIV	137	4	59	55	75	86	4	59	78
	138	3	x	49	26	38	3	45	80
	139	2	x	x	34	41	2	32	71
	140	1	50	61	57	72	1	58	89
XV	141	e	x	x	21	30	e	x	63
	142	t	x	x	24	19	t	x	64
	143	g	31	28	70	76	g	30	82
	144	b	x	x	11	10			
	145	v	35	33	56	57	v	32	76
	146	y	x	x	29	30			
	147	the	49	40	41	50	the	45	67
	148	we	x	x	22	21			

Table 2

Hoyt Reliability and Standard Error of Measurement of the LAT

Variable	Number of Items	Hoyt Reliability	Standard Error*
Key #1, Grade 4, Total LAT	148	.93	10.21
Key #1, Grade 6, Total LAT	148	.95	9.70
Key #2, Gr. 4 & 6, Total LAT	137	.95	9.95
Key #2, Gr. 4 & 6, Section I	8	.28	2.04
" " " II	15	.63	3.44
" " " III	5	.60	1.70
" " " IV	10	.72	2.40
" " " V	8	.69	2.26
" " " VI	16	.85	2.82
" " " VII	10	.75	2.61
" " " VIII	8	.70	2.13
" " " IX	9	.60	2.45
" " " X	8	.79	2.12
" " " XI	3	.32	1.20
" " " XII	11	.65	2.71
" " " XIII	17	.68	3.00
" " " XIV	4	.42	1.46
" " " XV	5	.38	1.73

*Note that standard error is calculated on the basis of two points per item.

approach significance (V, VI, and XIII), it seemed to reflect the fact that Fourth Grade boys were behind Fourth Grade girls, while at Sixth Grade the sexes had become more even.

Girls scored higher than boys on all subsections of tne LAT. In some instances (subsections III, VI, VIII, and XIV) the differences were significant beyond the .03 level. These four sections involved pronoun referent, affixes and root words, deletion processes, and unusual sound-grapheme correspondences. On total score, the females were significantly above the males ($p < .03$), but the analysis of covariance showed that at least part of this difference could already be accounted for by the measured IQ scores. Even with this linear effect of IQ removed, females were still significantly ($p < .05$) superior to males on three sections of the test; affixes, deletion, and sound-grapheme.

Grade Six scored significantly higher than Grade Four on total score ($p < .0001$) and on 13 of the 15 subsections ($p < .01$). The only sections that were not significantly different were IX and XV, which measured phoneme matching, and judging the frequency of use of letters and words. The analysis of covariance showed that the score differences between grade levels were not at all a result of differences in IQ.

Within a grade level, however, IQ was substantially correlated with total score on the LAT. This correlation reached .77. The complete matrix of correlations between IQ and subsection scores is presented in Table 6.

Table 3

List of LAT Test Items Meeting Various Criteria

Items Functioning at or below Chance		Items Answered 80% Correct		Items Showing Growth from Grade 4 to 6	
Grade 4	Grade 6	Grade 4	Grade 6	No Growth	Much Growth
# 8	#	# 1	# 1	# 1	# 8
12		2	2	7	12
15		4	4	11	28
21	21	6	6	18	29
23		7	7	19	31
26		51	51	21	32
33		52	52	36	34
34			53	51	45
35	35		54	66	46
36	36		57	79	49
39			58	85	54
41			59	86	55
42			60	88	56
44	44		62	90	58
45			63	103	59
47	47		64	112	64
50			77	118	67
56			80	121	68
72			82	126	69
91			83	130	71
93	93		87	132	72
97			94	142	74
98			96	144	75
99			102	145	76
111	111		106	146	77
114			116	148	94
115		117	117		95
118	118	119	119		96
127			120		97
130	130	122	122		98
134	134		124		99
141		125	125		104
144	144	126	126		107
148	148		129		114
			131		127
		133	133		
		136	136		
			137		

Table 4

Observed Cell Means for IQ, Total LAT Score, and 15 Subscales of the LAT

Variable	Fourth Grade Males	Fourth Grade Females	Sixth Grade Males	Sixth Grade Females	Fourth Grade	Sixth Grade	Males	Females	Mean of All Ss	Standard Deviation of All Ss
No. of Ss	55	51	52	53	106	105	107	104	211	
IQ	103.1	106.7	103.8	105.1	104.8	104.5	103.4	105.9	104.6	11.8
Total LAT	130.0	149.6	168.4	174.6	139.4	171.5	148.7	162.3	155.4	44.1
I	11.3	12.0	12.6	13.0	11.7	12.8	11.9	12.5	12.2	2.6
II	13.1	15.6	16.5	16.5	14.3	16.5	14.8	16.0	15.4	5.9
III	3.7	4.4	5.4	6.5	4.0	5.9	4.5	5.4	5.0	3.0
IV	5.3	5.5	7.1	7.5	5.4	7.3	6.1	6.5	6.3	4.8
V	5.2	7.1	9.5	9.4	6.1	9.5	7.3	8.3	7.8	4.3
VI	18.9	23.1	24.8	25.7	20.9	25.2	21.8	24.4	23.1	7.6
VII	6.8	8.0	11.7	11.5	7.4	11.6	9.2	9.8	9.5	5.5
VIII	8.6	10.7	11.3	12.0	9.6	11.6	9.9	11.4	10.6	4.2
IX	7.4	8.0	7.9	8.9	7.7	8.4	7.7	8.5	8.1	4.1
X	6.3	6.7	9.5	10.3	6.5	9.9	7.9	8.6	8.2	4.9
XI	3.5	3.7	3.9	4.5	3.6	4.2	3.7	4.1	3.9	1.8
XII	9.7	10.7	12.7	12.8	10.2	12.7	11.1	11.8	11.4	4.8
XIII	22 9	25.3	26.5	26.1	24.1	26.3	24.7	25.7	25.2	5.4
XIV	3.3	4.4	4.3	5.1	3.8	4.7	3.8	4.8	4.3	2.2
XV	4.0	4.4	4.4	4.9	4.2	4.6	4.2	4.7	4.4	2.5

Table 5

F Ratios and Significance Levels for the Factors Grade and Sex and the Interaction on the LAT

Variable	Grade		Sex		Grade x Sex		Analysis of Covariance Using IQ: Grade		Sex		Grade x Sex	
	F	p	F	p	F	p	F	p	F	p	F	p
Total LAT	32.8	.001	5.3	.022	1.4	ns	86.3	.001	3.1	.079	1.1	ns
I	10.9	.001	2.5	ns	.3	ns	13.7	.001	1.1	ns	.1	ns
II	7.8	.006	2.3	ns	2.6	ns	12.1	.001	.6	ns	2.2	ns
III	24.2	.001	5.0	.027	.2	ns	41.5	.001	2.6	ns	1.1	ns
IV	8.8	.004	.2	ns	.0	ns	13.6	.001	.2	ns	.5	ns
V	38.4	.001	2.9	.091	3.8	.052	52.2	.001	1.2	ns	3.4	.067
VI	19.4	.001	6.5	.012	2.8	.096	32.1	.001	4.1	.045	2.5	ns
VII	36.9	.001	.4	ns	1.0	ns	60.4	.001	.1	ns	.5	ns
VIII	12.8	.001	6.5	.011	1.7	ns	15.6	.001	4.5	.035	1.2	ns
IX	1.6	ns	2.1	ns	.1	ns	2.5	ns	.7	ns	.6	ns
X	28.7	.001	.8	ns	.1	ns	45.1	.001	.0	ns	.8	ns
XI	7.2	.008	2.8	.098	.7	ns	8.6	.004	1.4	ns	1.3	ns
XII	16.3	.001	.7	ns	.5	ns	30.4	.001	.0	ns	.1	ns
XIII	9.5	.002	1.9	ns	3.8	.052	12.3	.001	.6	ns	3.3	.069
XIV	9.2	.003	9.7	.002	.2	ns	11.1	.001	7.4	.007	.0	ns
XV	1.8	ns	1.8	ns	.0	ns	2.2	ns	.9	ns	.0	ns

Table 6

Correlation Matrix for Intelligence and the LAT

Variable	LAT	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV
IQ	.77	.41	.55	.62	.55	.49	.60	.60	.38	.48	.58	.35	.66	.43	.36	.29
I	.55	1.00														
II	.71	.35	1.00													
III	.67	.39	.49	1.00												
IV	.66	.34	.42	.38	1.00											
V	.61	.26	.39	.49	.35	1.00										
VI	.77	.39	.53	.43	.42	.39	1.00									
VII	.75	.40	.48	.52	.46	.44	.53	1.00								
VIII	.60	.35	.39	.37	.27	.30	.44	.32	1.00							
IX	.66	.33	.40	.32	.51	.27	.46	.45	.34	1.00						
X	.71	.28	.40	.49	.39	.44	.49	.56	.42	.43	1.00					
XI	.47	.29	.27	.34	.24	.42	.28	.37	.30	.23	.32	1.00				
XII	.78	.43	.51	.50	.44	.47	.60	.50	.43	.45	.53	.34	1.00			
XIII	.64	.28	.37	.38	.44	.30	.39	.38	.40	.37	.38	.23	.46	1.00		
XIV	.56	.32	.32	.23	.33	.40	.39	.40	.33	.44	.35	.26	.45	.33	1.00	
XV	.43	.29	.31	.30	.15	.14	.25	.30	.24	.31	.26	.13	.32	.28	.19	1.00

IV
DISCUSSION

The care taken in the preparation of the LAT resulted in a very successful and useable measurement instrument. Prior to the field-testing reported in the present paper, psycholinguistic ability had been defined as precisely as possible. As reported in Working Paper No. 33/a list of behavioral skills in the area of psycholinguistic ability was compiled and multiple-choice test items were constructed to measure each skill. After initial revisions and application of knowledge gained in a pilot study, the present version of the LAT was developed. The LAT was given to 211 Ss in the upper elementary grades, and the results as reported above were obtained. Several of these results deserve comment and need to be viewed in perspective and the future of the LAT can to some extent be anticipated.

The success and useability of the LAT is strongly indicated by the markedly high Hoyt R at both Grade Four and Grade Six. Presumably the Hoyt R for Grade Five would be equally acceptable. An internal consistency of .95 implies that 90% of the observed variance is true measurement variance of the skill or ability reflected by the test as a whole. Thus, whatever estimates of validity of measurement can be obtained in the future, they will not be limited by an already low internal consistency. Eleven of the subsections of LAT showed Hoyt R's that were above .60 (See Table 2). At this level of consistency of measurement, various of these subsections will possibly be of value as diagnostic instruments to detect specific strong or weak abilities of an individual or a group.

Other evidences of the success of the LAT in the present field test were the high proportion of correct options that showed a significant biserial correlation with the total test score, the distribution of items across a wide range of difficulty, and the rather even distribution of Ss' scores over a wide range (Appendix D). Planned revisions of some items and sections of the test (revisions shown in Appendix B) should make the proportion of significant biserial R's even higher. The wide distribution of item difficulties makes it possible to use the LAT for groups of varying abilities and grade levels and assures that some proportion of the items are discriminating between good and poor Ss throughout the range. The fact that the Ss' scores were spread over a broad range implies that the test is discriminating at all ability levels. There was no apparent ceiling effect at either the high or low levels, implying that measurement of other groups more diverse in skills than the present Ss is possible.

The mean total scores of Fourth- and Sixth-Grade Ss were about 3/4 of a standard deviation apart. Such a difference is clearly sufficient to distinguish statistically between the groups, and still provides for overlap in the distribution of scores. The overlap seems desirable, since it is intuitively known that the language ability of the better Fourth Graders is superior to that of the poorer Sixth Graders. Similarly, the slight superiority of females to males (especially at Fourth Grade) is confirmed by other research and agrees with intuitive notions about differences between the sexes in verbal skills in the elementary school.

The analysis of variance revealed some interesting facts about the test and about Fourth and Sixth Graders as well. The two subsections that showed no growth from Fourth to Sixth Grade were IX—comparing the phoneme equivalence of various graphemes, and XV—judging frequency of occurrence of letters and words. The latter was not very well understood and the judging task, comparing five options simultaneously, may iteself have been too difficult. Subsection XV will be revised (See Appendix B) and only after the revision is tested can it be determined whether a sensitivity to frequency of use has developed at

Sixth Grade. Subsection IX showed no immediately apparent reason for its failure to discriminate grade level. Scores were rather low, though still above a chance level, so that, theoretically, the Sixth Graders had the opportunity to show their superiority. Perhaps the lack of opportunity for Ss to vocally rehearse the sounds for themselves apart from the tape recording was a factor, while, on the other hand, such discriminating ability may not increase until a later age. On all the other measures, Sixth Graders showed a marked and significant increase over Fourth Graders. The largest differences were, in order, in subsections: V—sentence transforms; VII—word function; X—nonsense questions; III—pronoun referent; VI—affixes; XII—well-formed sentences; and VIII—deletion processes.

The subsections which Ss performed well on appeared to be: VI—affixes; XIII—verb string; VIII—deletion processes; and I—syntax. Subsections IV—phonemic clues; IX—phonemic equivalence of graphemes; VII—word function; and X—nonsense questions, appeared to be the most difficult.

Six of the subsections, because of their high internal consistency and significant increase from Fourth to Sixth Grade, seem to be appropriate for diagnosis of specific abilities. These six subsections measured the following abilities: III—determining pronoun referent; V—transforming a given sentence; VI—recognizing roots, prefixes, and suffixes; VII—recognizing forms and functions of words in sentences; X—using sentence structure to determine meaning; and XII—constructing well-formed sentences.

The LAT score and IQ were definitely closely related. Indeed, IQ tests normally include tasks that require various psycholinguistic abilities. Within the cells defined by grade and sex, nearly 60% of the variance was common to both IQ and LAT. (Approximately 30% of the remainder could be attributed to specific psycholinguistic abilities, and 10% to error of measurement.) It may be that the further testing of the LAT in relation to IQ may help define what specific abilities in the verbal area account for the differences observed in the global IQ.

The Otis and LAT were about as closely related as two IQ tests might be expected. Whether or not the LAT is sufficiently unique to provide additional data about a student must still be demonstrated. In theory three kinds of tests, LAT, IQ, and language achievement, could be used together in determining the characteristics of a student. An achievement test would indicate the memory and application skills the student had available as a result of classroom activities in language arts. The IQ test would specify the level of problem solving ability, both inherited and experiential, available to the student. And the LAT would show the extent of the student's specific skills in linguistics, his conception of the systematic nature of language.

The LAT appears worthy of further research and development. Conceptually, the implication of "psycholinguistic ability" as a set of measureable, important, and teachable behaviors that can be specified as distinct from the typical test of language achievement and also from the usual skills in verbal intelligence tests is an attractive idea. Initially, the measurement of such a set of behaviors has seemed possible and promising; and further work will determine the contribution such measurement can make in providing more data about the important abilities that are available to students of an upper elementary level and which of these abilities can be strengthened or used advantageously by and through appropriate teaching activities. The LAT presents some possibility of use for diagnosing rather specific skills. It appears suited to the upper elementary levels, since the student can begin to give evidence of his linguistic ability in written discourse at this age.

Further research involving the LAT is being prepared. A future report will present the relationships between the subsections of the LAT and the quality and quantity of written discourse produced by upper elementary students. Comparing psycholinguistic ability to the actual writing samples of Ss should provide data on the fruitfulness of the LAT in measuring meaningful dimensions of ability.

APPENDIX A

Linguistic Ability Measurement Program

The date today is _____ ____, 19__. My name is _____.
I am _____ years old, and I was born in the month of _____. I am in grade _____ at
_____School. My teacher's name is _____. My father
works as (give his occupation; if he is not living with you, put an X) _____
_____. My mother is (give her occupation, or housewife, or X if she
is not living with you) _____. I am a member
of the _____ race and of the _____ sex.

GENERAL DIRECTIONS

This is a test of your language ability. It will show what kinds of things you can do with words and sentences. The directions for each part of the test have been tape-recorded. The voice in the recording will read the directions and some of the questions so you will know what to do in each part of the test. For each problem or question your job will be to choose the one answer you think is best. Answer as many of the items as you can, and always guess if you are not sure. If you have a question during the test, raise your hand and someone will help you. Please make your marks readable and use the test booklet for writing and making notes. Work carefully, have a good time, and follow along as we begin.

This product was developed by the Wisconsin Research and Development Center for Cognitive Learning pursuant to a contract with the United States Office of Education, Department of Health, Education, and Welfare, Center C-03/Contract OE 5-10-154. The endorsement or nonendorsement of this product is not a stipulation of the aforesaid contract.

Section I

In each set mark with an X the sentence you think is better.

_____ The car of the man is in the lot.

1.
_____ The man's car is in the lot.

_____ The bottom of the pail is rusty.

2.
_____ The pail's bottom is rusty.

_____ The lady that left was old.

3.
_____ The lady who left was old.

_____ He wanted to really go.

4.
_____ He really wanted to go.

_____ Hide now quickly under the porch.

5.
_____ Now hide quickly under the porch.

_____ We'll meet here briefly tomorrow.

6.
_____ We'll meet tomorrow here briefly.

_____ Briefly tomorrow we'll meet here.

7.
_____ We'll meet briefly here tomorrow.

_____ A short, bald, wrinkled, ten-year-old witch ran by.

8.
_____ A ten-year-old, bald, short, wrinkled witch ran by.

_____ The coals are very hot which are glowing.

9.
_____ The very hot coals are glowing.

Section II

The list below has groups of letters that are not "real" English words. But some of the letter groups seem more like words than others. You are to mark each item with a 1, 2, 3, or 4, where each number means the following:

1. Could easily be an English word.
2. Like English but not as close as 1.
3. Pretty far from "real" English.
4. Could never be an English word.

The first four are done for you.

A. 4 ctuwzl

B. 1 binnel

C. 2 edapio

D. 3 hyrsth

10) E. _____ rimmel

11) F. _____ cdaepm

12) G. _____ zorch

13) H. _____ pitka

14) I. _____ benlum

15) J. _____ yturpe

16) K. _____ quprx

17) L. _____ hiromi

18) M. _____ apatua

19) N. _____ renfros

20) O. _____ bosked

21) P. _____ kjaere

22) Q. _____ sllorj

23) R. _____ xetaph

24) S. _____ snarky

25) T. _____ wurfk

26) U. _____ traoo

27) V. _____ grige

Section III

In this sentence, "The problem is difficult but it can be solved," the word it refers to problem. For each item below choose the word that the underlined word refers to. Circle the letter of the word you think is correct.

28) A man can get a cold and be very sick unless he treats it promptly and rests.

a. man
b. cold
c. sick
d. he
e. rests

29) The poet compared the sea with some wild animal of the jungle that was waiting to pounce on its victim.

a. poet
b. sea
c. animal
d. jungle
e. victim

30) In our country when towns were being named at a great rate, a board was set up which tried to organize the naming.

a. country
b. towns
c. rate
d. board
e. naming

31) The notebook on her desk covered up my drawing which was very messy.

a. notebook
b. desk
c. covered up
d. drawing
e. messy

32) Bernie was a 12-year-old who had a friend and a dream. He wanted a jeep.

a. Bernie
b. 12-year-old
c. who
d. friend
e. jeep

Section IV

One can think of luv as a disguised spelling of love. Or thnkfl might be a disguised way of writing thankful. Below are two lists of such disguised words. Find the word in List I that means about the same as the first word in List II. Put the number of that word in the blank. Do this for each word in List II. The first one has been done for you. One word will be left over in List I.

List I		List II	
1.	kwikle	__2__	owtdorz
2.	owtcighed	33) _____	aksion
3.	tellafown	34) _____	joeckx
4.	knobodie	35) _____	aynnamull
5.	wridelz	36) _____	phassed
6.	addvenshur	37) _____	nohwon
7.	krecher		

Do the same for Lists III and IV. Pick the word in List III that means about the same as a word in List IV and write the correct number in the blank. Two words will be left over in List III.

List III		List IV	
1.	pepl		
2.	dowt	38) _____	simbl
3.	rgumnt	39) _____	phyt
4.	mblm	40) _____	unsrtn
5.	sidr	41) _____	nsekt
6.	egr	42) _____	xsytd
7.	betl		

Section V

In these next problems, you are given a sentence. Your job is to make a new sentence based on the given sentence. The new sentence should mean the same thing as the given sentence and should begin with the words shown. Look at this example:

John was given a ride by Pete.
Pete _____

1. g a r
2. g J a r
3. w g a r b J
4. r w J

The sentence based on the given sentence and meaning the same thing is "Pete gave John a ride." The correct answer is 2, g J a r, since these are the first letters of the words in the new sentence. For each problem think what

the new sentence would be and then circle the number of the answer that lists the letters. Try this second example before starting:

Nobody is at home.
There _____

1. n i a h
2. i n t a h
3. i n a h
4. a h i n h

If you answered 3, for There (is nobody at home) you are correct. Do these next problems in the same way. Think the new sentence and circle the number of the correct answer.

43) Not until after lunch did Mary help me.
Mary _____

1. h m a l
2. d n h m a l
3. d n h m u a l
4. h m o a l n u

44) I quit because of him.
It is _____

1. b o h t I q
2. b o h I q
3. q o h
4. h t q b o i

45) The law makes them guilty.
They are made _____

1. g t l m t
2. g
3. g b t l
4. g b o t l

46) Many hills rose in the distance.
In the _____

1. d r m h
2. d t h r
3. d w m h
4. h m w d

47) John himself must win this race.
This _____

1. J h m r
2. r m b w b J h
3. r J m w t r
4. r J m w
5. r J m w h

48) The old chief was leader of all the tribes.
Leader _____

1. w t o c
2. i t c o a t t
3. o t o c w a t t
4. o a t t w t o c

49) A truck hit that light pole.
That light pole _____

1. f d o t t
2. w h b a t
3. a a t w h
4. h a t

50) Someone threw his cap into a pond.
His cap _____

1. w t i a p b s
2. f i a p
3. w t i a p
4. w t i a p b h
5. g t i a p

Section VI

The word unmindful has three parts, un + mind + ful. The first part, un, is called a prefix; mind is called the root word; and ful is a suffix. Below is a list of prefixes, root words, and suffixes. You are to put a P before the prefixes, RW before the root words, and S before the suffixes.

51) _____ un
52) _____ ly
53) _____ ed
54) _____ read
55) _____ ment
56) _____ trans
57) _____ care
58) _____ turn
59) _____ ence
60) _____ dis
61) _____ ation
62) _____ ness
63) _____ mis
64) _____ ish
65) _____ ities
66) _____ il

Section VII

You are given pairs of sentences which have some parts underlined. Decide which of the choices in the second sentence are <u>used in the same way</u> as the underlined part in the first sentence. For example, look at these two sentences:

Bob <u>threw</u> his gloves behind the chair.
<u>One</u> of <u>the lions</u> <u>roared</u> <u>for</u> his supper.
a b c d

Which of the underlined parts are used in the same way as <u>threw</u>? The correct choice is <u>c</u> because both <u>roared</u> and <u>threw</u> name the kind of action in the sentences. Write <u>a</u>, <u>b</u>, <u>c</u>, or <u>d</u> for each item.

He saw the sign <u>but</u> didn't stop.
67. _____

You <u>may</u> do the <u>dishes</u> <u>or</u> take <u>out</u> the garbage.
a b c d

A <u>motorcycle</u> was parked in the alley.
68. _____

<u>Leaves</u> <u>blew</u> <u>against</u> the <u>curb</u>.
a b c d

The elephants melted <u>silently</u> into the trees.
69. _____

The <u>fierce</u> <u>storm</u> <u>was</u> moving <u>fast</u>.
a b c d

<u>Since</u> you are home, let's eat early.
70. _____

<u>I'll</u> do <u>it</u> <u>when</u> the show is <u>over</u>.
a b c d

A <u>rather</u> skinny dog stared at the door.
71. _____

Sally <u>looked</u> <u>very</u> <u>pretty</u> <u>last</u> night.
a b c d

A squad car <u>blocked</u> the alley.
72. _____

<u>This</u> piece of <u>bread</u> <u>tastes</u> <u>stale</u>.
a b c d

The party, <u>in general</u>, was very boring.
73. _____

<u>Fortunately</u>, <u>Stanley</u> <u>wasn't</u> <u>invited</u>.
a b c d

GPO 816-651-4

The bus will be leaving twenty minutes late.

74. _____

The field trip should have given you ideas.
a b c d

The girl in that picture is my sister.

75. _____

Two boys played ball on the playground.
a b c d

Milwaukee is a large city.

76. _____

A brown box sat on the stairs.
a b c d

Section VIII

For each sentence below, you are to decide which word (or words) could be left out without changing the meaning of the sentence. For example, in the sentence, "I know that you are honest." that could be left out, leaving a sentence which means the same thing, "I know you are honest." For each item write a, b, c, or d in the blank to show which underlined part could be left out. If you think no underlined parts can be left out without changing the meaning, write N in the blank.

77) _____ I hope that you are a friend.
a b c d

78) _____ Mom makes good potatoes and good gravy.
a b c d

79) _____ Either Ed or Bill went to the store.
a b c d

80) _____ The principal said that they were not to blame.
a b c d

81) _____ The note which was hidden in the bushes was safe.
a b c d

82) _____ I would like for you to finish the job.
a b c d

83) _____ No one is as heavy as Ernie is heavy.
a b c d

84) _____ Jay slammed the door and Jay jumped off the porch.
a b c d

Section IX

In the problems on the following page you are given a word followed by four other words. A part of each word is underlined. From the set of choices, select the one whose underlined part sounds most

like the underlined part of the first word. Circle the letter of the correct choice. Look at the example:

bite a. sit b. view c. fight d. little

The part that sounds most like the i in bite is the igh sound in fight. So c is the correct answer in the example.

85)	jug	a. finger	b. danger	c. charge	d. shut
86)	design	a. sign	b. zero	c. desk	d. voice
87)	enough	a. stuff	b. through	c. shove	d. half
88)	anger	a. angle	b. hanger	c. angel	d. danger
89)	dressed	a. wanted	b. bed	c. mixed	d. ask
90)	exist	a. ax	b. edges	c. Texas	d. eggs
91)	house	a. even	b. help	c. new	d. know
92)	lodge	a. gem	b. gum	c. chair	d. ship
93)	heads	a. bats	b. glasses	c. trees	d. seed

Section X

List I contains a set of nonsense questions. List II has the answers to the questions. Before each question in List I write the letter of the answer for that question. One sentence in List II will be left over.

List I	List II
	A. A turfee was klibbed menitely.
94) _____ What did the klib hinkle?	B. The klib hinkled a snafrat.
95) _____ How was a turfee klibbed?	C. The turfee was klibbed by a sneel.
96) _____ Where did the klib hinkle?	D. The klib hinkled in a boofram.
97) _____ Who klibbed the turfee?	E. A turfee hinkled the klib's torp.

Do the same for Lists III and IV. One sentence in List IV will be left over.

List III	List IV
	F. Duhinks nac the ploes to klib.
98) _____ What did klib duhink?	G. Plo was klibbed very duhink.
99) _____ When did klib plo?	H. Klib duhank the plo.
100) _____ How was plo klibbed?	I. The duhink was klibben to the plo by nac.
101) _____ Who klibbed the duhink?	J. Klib ploded duhinkly.

Section XI

You are given a set of short sentences and a set of longer sentences. Only one of the longer sentences combines the shorter sentences correctly. In each set put an X before the sentence that you think combines the shorter sentences in the best way.

102) The lady's tire is flat.
The policeman is helping the lady.

_____ A. The policeman whose tire is flat is helping the lady.

_____ B. The policeman is helping the lady whose tire is flat.

_____ C. The lady is being helped by the policeman whose tire is flat.

103) The sky was gray.
Rain fell from the sky.
The rain was frozen.

_____ A. The sky, from which the fallen rain was frozen, was gray.

_____ B. The frozen rain which fell from the sky was gray.

_____ C. The frozen rain fell from the gray sky.

104) Jane cried all day.
Jane had a doll.
The doll was broken.

_____ A. Jane, whose doll was broken, cried all day.

_____ B. Jane cried all day, the doll was broken.

_____ C. Jane had a broken doll who cried all day.

Section XII

For each problem on this page, circle the letter of the answer which you think is the best way to complete the sentence. For example, if you were given the sentence, "Somebody _____ to do that yesterday." and these choices:

a. didn't
b. will have
c. tried
d. else wants

you would circle the letter c because it is the best way to complete the sentence, "Somebody tried to do that yesterday."

105) There is _____.

a. my desk, please
b. some boys and girls
c. more than ten people
d. something to do

106) _____ strikes the car and runs.

a. Boys
b. The boy
c. I
d. We

107) John came _____ two points of winning.

a. from
b. by
c. within
d. almost
e. back

108) _____ nor were any tiny ones.

a. There were big ones
b. None of the big ones were there
c. I have no little

109) He seemed _____ and he spoke _____.

a. saddened, sadness

b. sadly, sadder

c. sad, sadly

d. sadder, sad

110) The boy has two _____ and _____ tomorrow.

a. biffles, biffles

b. biffle, biffled

c. biffling, will biffling

d. biffIness, biffler

111) Except for pancakes, _____

a. how about some ice cream?

b. we had apples.

c. I like anything else.

d. I don't like breakfast.

112) _____ barely five, my father sent me to school that fall.

a. Although

b. Inspite of being

c. Although I was

d. Since

For these problems circle the letter of the answer you think completes the sentence best.

113) Since food will make you grow, it is possible that short people are _____

a. not grown up yet.

b. not fed properly.

c. living in China.

d. spending their money on things beside food.

114) If you are late, _____

a. the bus will leave.

b. I must begin on time.

c. it has happened to us, too.

d. another person will get your place.

115) In baseball, the time between pitches should be shorter because _____ would like to see the game speeded up.

a. my father

b. I

c. everybody

d. the players and fans

116) Mice probably like to eat corn since _____

a. they are often found in cornfields.

b. the beginning of time.

c. I once saw one eating some.

d. it tastes very good.

Section XIII

In the sentence, "We went to the game," the word went fits correctly. But you would not say "We could to the game." In the list below, mark the items that fit in the sentence with a Y (for Yes) and the ones that don't fit with an N (for No).

We _____ to the game.

117) _____ went

118) _____ were

119) _____ be

120) _____ are to go

121) _____ were willing

122) _____ could

123) _____ gone

124) _____ going

125) _____ rides

126) _____ rushed

127) _____ ought to have wanted to go regularly

128) _____ ought to have been going

129) _____ may have been to go

130) _____ have rode a horse

131) _____ did not

132) _____ can be going

133) _____ could go

134) _____ of course, were going

135) _____ are to be going

136) _____ become

Answer each question by circling the number of the one best answer.

137) How would you spell door using the spellings for the d sound in butter, and and the oor sound in more?

1. te
2. utoe
3. bre
4. ttore

138) How would you spell slave using the sl sound in pencil, the a sound in eight, and the v sound in of?

1. ceif
2. cleife
3. cileighf
4. cilehf
5. cliev

139) How would you spell fish using the spellings for the f sound in rough, the i sound in women, and the sh sound in nation?

1. ougoat
2. ghoti
3. hit
4. ughoation
5. gwot

140) How would you spell fish using the spellings for the f sound in phone, the i sound in mountain, and the sh sound in anxious?

1. phaixi
2. hounx
3. painiou
4. pontanx

For the sets of letters in problems 1, 2, and 3, circle the one letter in each set that you think is used most often in writing.

141) 1. a e i o u

142) 2. t r l d w

143) 3. g j x z q

For the sets of letters in problems 4, 5, and 6, circle the one letter in each set that you think is used least often in writing.

144) 4. s r b h n

145) 5. m c f v y

146) 6. a i o u y

For problem 7, circle the one word that you think appears most often in writing.

147) 7. and the for be I

For problem 8, circle the one word that you think appears least often in writing.

148) 8. of at on to we

APPENDIX B

Revisions made in the Present LAT

I. Sections changed:

Section II revised to the following format:

(Added to instructions) Do each set of four below. Mark "1" for the word closest to English, "2" for the next best, "3" for the next, and "4" for the farthest from English.

_____

___ zorch

___ odaepm

___ pitka

___ wurfk

_____

___ hiromi

___ sllorj

___ grige

___ traoo

_____

___ quprx

___ renfros

___ xetaph

___ snarky

_____

___ bosked

___ apatua

___ benlum

___ kjaere

_____

Section XV revised to the following format:

For the pairs of letters and words below, choose the one that you think is used more often in writing. Mark "1" on the answer sheet if you think the first one is used more often, mark "2" if you think the second one is used more often.

1		2
e	or	i
t	or	l
w	or	r
g	or	j
y	or	o
x	or	z
b	or	s
f	or	v
the	or	for
of	or	we
I	or	and

II. Instructions changed:

All instructions were rewritten to incorporate the use of a separate machine scorable answer sheet.

III. Items deleted:

2, 10, 15, 115, 117, 118, 129

IV. Items changed:

11) cdaepm → odaepm

44) 2. b o h I q → 2. b o h i i q

3. q o h → 3. q b o h

45) 4. g b o t l → 4. g m t l

47) Option 2. (deleted)

50) Option 3. (deleted)

68) the curb. → the curb
d d

78) Mom makes good potatoes
a b

and good gravy.
c
d

→ Mom makes good potatoes and
a b c

good gravy.
d

81) The note which was hidden
a b

in the bushes was safe.
c d

→ The note which was hidden in
a b c

the bushes was safe.
d

93) a. bats → a. bus

107) Option e. (deleted)

108) Option d. Unless it is so (added)

109) He seemed _____ and he spoke _____.

→ He seemed _____.

Options changed from: saddened, sadness to: saddened, and he spoke sadness

110) The boys has two _____ and _____ tomorrow.

→ The boy has two _____.

Options changed from: biffles, biffles to: biffles, and biffles tomorrow

111) c. I like anything else →

c. When they are good and hot.

114) a. the bus will leave →

a. try to be earlier

127) ought to have → had

130) have rode a horse → have rode

132) can be going → have been

138) Option 2. (deleted)

139) Option 3. (deleted)

4. ughoation → 4. ughoion

GPO 816-651-3

APPENDIX C

The abilities measured by the 15 subsections of the Language Ability Test

I. To evaluate syntax holding the meaning constant.

II. To distinguish probable English grapheme clusters from improbable English grapheme clusters.

III. To determine pronoun referents.

IV. To recognize a word in the Ss lexicon, given a clue from more or less predictable phoneme-grapheme correspondences.

V. To transform a given English sentence to a synonomous sentence by changing word order and not introducing new content words.

VI. To recognize morphemes as roots, prefixes, and suffixes.

VII. To recognize form-class and function-class slots (positions) in sentences.

VIII. To use the deletion transformation.

IX. To recognize the phoneme equivalents of various English graphemes and grapheme clusters.

X. To recognize the structures of various questions in order to produce the appropriate response structures.

XI. To embed one base sentence in another base sentence to produce a well-formed transform sentence.

XII. (1-8) To distinguish well-formed English sentences.

XII. (9-12) To recognize logical meaning relationships between elements of a sentence.

XIII. To properly expand the tranformational auxiliary of the verb phrase.

XIV. To use unpredictable and rare orthographic patterns in spelling English words.

XV. (1-6) To determine vowel and consonant.letter frequency in English.
(7-8) To determine function-word frequency in English sentences.

APPENDIX D

Frequency Distribution of Total Scores on the LAT (Key #2)

Total Score 2 pts per item	Fourth Grade	Sixth Grade	Males	Females
68- 70	xx	x	xx	x
72- 74	xx		x	x
76- 78	xxx		xxx	
80- 82	xx		xx	
84- 86	xx		xx	
88- 90	xx		x	x
92- 94	xx	xx	xxx	x
96- 98	xx	xxx	xxxxx	
100-102	x	xxxx	xxxx	x
104-106	xxxx	xx	xx	xxxx
108-110	x	xx	x	xx
112-114	xxx	x	xx	xx
116-118	xxxxxx	xx	x	xxxxxxx
120-122	xxxxxxxxx	xx	xxxxxxxxx	xx
124-126	xxxxx	xxx	xxxx	xxxx
128-130	xx	xx	x	xxx
132-134	xxxxx	x	xxx	xxx
136-138	xxxx	xx	xx	xxxx
140-142	xxx	x	xx	xx
144-146	xxxx	x	xx	xxx
148-150	x	xxx	xxxx	
152-154	xxxx	xx	xxx	xxx
156-158	xxx	xxx	xx	xxxx
160-162	xxxxx	x	xxxx	xx
164-166	x	xxxxx	xxxx	xx
168-170	xx	xxxx	xxxx	xx
172-174	xxx	xxxxxxx	x	xxxxxxxxx
176-178	x	x		xx
180-182	xxxxxx	xxx	x	xxxxxxx
184-186	xxx	xx	xxx	xx
188-190	xxxx	xxxx	xxxx	xxxx
192-194		xxxx	xx	xx
196-198	x	xxxxxxx	xxxxxx	xx
200-202	xxx	x	xxx	x
204-206		xxx	xx	x
208-210	x	xxx	xx	xx
212-214		xxxx	x	xxx
216-218	xxx	xxxx	xxx	xxxx
220-222		xxxxxx	xxx	xxx
224-226				
228-230				
232-234	x	xxx	x	xxx
236-238		x		x
240-242		xxxx	xx	xx
244-246		x		x

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